UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,745	09/05/2003	Robert William Courtenay	303.936US5	9069

21186 7590 03/30/2007

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
JOLLEY, KIRSTEN	
ART UNIT	**PAPER NUMBER**
1762	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE.	DELIVERY MODE
3 MONTHS	03/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/656,745	COURTENAY, ROBERT WILLIAM	
	Examiner	Art Unit	
	Kirsten C. Jolley	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17,31-33 and 35-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17,31-33,35-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The 35 USC 112, 1st paragraph and 2nd paragraph rejections have been withdrawn in response to Applicant's amendments to the claims.

2. The 35 USC 103(a) rejections over Adams or Hillman et al. taken in view of Sakawaki have been withdrawn in response to Applicant's amendments to the claims requiring the generation and spraying of a dispersed mist of the coating material.

Applicant's arguments with respect to claims 17, 31-33, and 35-41 have been considered but are moot in view of the new ground(s) of rejection. In response to Applicant's amendments requiring spraying a dispersed mist of coating material, the claims are now rejected over the newly cited prior art of Reardon et al. alone or in view of Adams, and in view of Sakawaki as discussed below.

Examiner Suggestion

3. In claim 17, line 4 and claim 39, line 4, the Examiner suggests replacing "dispersed mist *from* the material [emphasis added]" with --dispersed mist of the material--.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 17, 31-33, and 35-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reardon et al. (US 5,658,387) alone or in view of Adams (US 5,395,803), and taken in view of Sakawaki (US 4,267,212).

Reardon et al. discloses a method of dispensing coating material in the form of a dispersed, atomized mist on a rotating substrate by starting spraying at a radial position outboard of the substrate, then pivoting the nozzle so that it is "swept to or through the rotational axis of the wafer," and then moving the nozzle "outwardly" during a "return spraying process" (col. 6, lines 42-49; col. 7, lines 60-67; and col. 13, line 41 to col. 14, line12). While Reardon et al. does not explicitly state that motion of the nozzle and spraying are stopped over the opposite edge of the substrate, it is the Examiner's position that it would have been obvious for an engineer having ordinary skill in the art to have continued spraying across the diameter and stopping at the opposite edge since Reardon et al. teaches sweeping through the rotation axis (center) and since continuing to move and spray beyond the outer edge of the substrate would only result in a waste of coating solution.

Further, independent claim 39 requires starting spraying while over a first edge of the substrate. Reardon et al. discloses that it is "preferred" to start the spraying in a radial position outboard of the substrate in order to reduce or eliminate any transitory startup effects before the coating spray contacts the substrate surface (col. 13, lines 60-65). However, it is the Examiner's position that it would have been obvious to an engineer skilled in the art that spraying and movement may alternately start at a radial position over the substrate's edge, instead of outboard of the substrate, with the expectation of successful results and with the expectation that transitory

startup effects may affect the applied coating. The omission of an element with the consequent loss of its function has been upheld as within the level of skill of the ordinary artisan. *In re Wilson*, 153 USPQ 740.

Alternatively, Adams is cited for its teaching that it is known to dispense coating material on a rotating substrate by commencing spraying/nozzle movement at the outside edge of the substrate, moving the nozzle radially inwards to the center of the substrate, moving the nozzle radially back outwards to the outside edge, and then stopping spraying/nozzle movement at the outside edge (col. 3 of Adams). Thus Adams teaches that it is well known to spray along a radial line and to start and stop nozzle movement and spraying at the outside edges of the substrate's circumference. While Adams teaches retracing its radial path instead of continuing along the diameter, it is the Examiner's position that it would have been obvious to have alternatively started spraying/nozzle movement at one edge of the substrate, traversed through the center of the substrate, and stopped at the opposite edge of the substrate with the expectation of equivalent results since both movements would result in the nozzle traversing along a radial path twice.

It is noted that both Reardon et al. and Adams teach movement of a nozzle in a somewhat arc-like path because the nozzle pivots from a stationary base. Sakawaki is cited for its teaching of a nozzle which moves in a straight line over the diameter of a wafer as illustrated in Figure 4, not in an arc-like path. It would have been obvious for one having ordinary skill in the art to have performed the spraying in the method of Reardon et al., taken alone or in view of Adams, in a straight line over the diameter, as is known from Sakawaki, instead of in an arc-like path, with the expectation of equivalent and successful results since both arc-like and straight paths would result in complete coverage of the substrate with coating solution.

As to claims 31 and 40, Reardon et al. teaches rotating at a speed in the range of 1-1000 rpm (col. 13, lines 45-46). Overlapping ranges are *prima facie* evidence of obviousness. It would have been obvious to one having ordinary skill in the art to have selected the portion of Reardon et al.'s rotational speed range that corresponds to the claimed range. *In re Malagari*, 184 USPQ 549 (CCPA 1974).

As to claims 32-33 and 40, Reardon et al. is silent with respect to the temperature and humidity during rotating. The Examiner notes that a humidity of 50% and temperature of 72 degrees F reads on ambient/room temperature and humidity, and are well known and commonly used during spin coating processes. It would have been obvious for one having ordinary skill in the art to have used the claimed temperature and humidity values as a matter of routine experimentation, since they are similar to room temperature, in the absence of a showing of criticality.

As to claims 35-36, Reardon et al. discloses use of a nozzle which provides good atomization of the coating liquid (col. 7, lines 60-67). Atomization would necessarily produce a fine mist and dispersed and divergent pattern.

As to claim 37, the coating materials of Reardon et al. necessarily includes organic solvent. As to claims 38 and 41, while Reardon et al. is mainly directed to the use of photoresist coating materials, it does not exclude the use of other coating materials. It is the Examiner's position that it would have been obvious to one having ordinary skill in the art to have used Reardon et al.'s spin coating process with any materials that are commonly applied to semiconductor wafer substrates by spin coating, including dielectric polymer materials, with the expectation of similar and successful results.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kirsten C Jolley
Primary Examiner
Art Unit 1762

kcj